WHAT IS CLAIMED IS:

- 1. A method of treating cancer in a human, which comprises administering to the human a combination of (i) a therapeutically effective amount of one or more arsenic compounds, and (ii) radiation.
 - 2. The method of claim 1, wherein the arsenic compound is arsenic trioxide.
- 3. The method of claim 2, wherein the arsenic trioxide is formulated as an ionic aqueous solution.
- 4. The method of claim 1, wherein the total daily amount administered of the arsenic compound is from about 10 g to about 200 mg.
- 5. The method of claim 1, wherein the total daily amount administered of the arsenic compound is from about 0.5 mg to about 150 mg.
- 6. The method of claim 1, wherein the total daily amount administered of the arsenic compound is from about 0.5 mg to about 70 mg.
- 7. The method of claim 1, wherein the arsenic compound is administered parenterally.
- 8. The method of claim 1, wherein the arsenic compound is administered intravenously.
- 9. The method of claim 1, wherein the radiation and the arsenic compound are administered in combination with an effective amount of at least one further therapeutic agent.
- 10. The method of claim 9, wherein the further therapeutic agent is a chemotherapeutic or radiotherapeutic.
- 11. The method of claim 9, wherein the further therapeutic agent is selected from the group consisting of etoposide, cisplatin, carboplatin, estramustine phosphate, vinblastine, methotrexate, hydroxyurea, cyclophosphamide, doxorubicin, 5-fluorouracil, taxol, diethylstilbestrol, VM-26(vumon), BCNU, all-trans retinoic acid, procarbazine, cytokines, therapeutic vaccines, and immunomodulators.
- 12. The method of claim 2, wherein the dose is varied according to the body weight of the human.
 - 13. The method of claim 2, wherein the cancer is a hematopoietic cancer.
 - 14. The method of claim 2, wherein the cancer is a leukemia.
- 15. The method of claim 14, wherein the leukemia is an acute myelogenous leukemia.
- 16. The method of claim 14, wherein the leukemia is a chronic myelogenous leukemia.

- 17. The method of claim 2, wherein the cancer is a lymphoma.
- 18. The method of claim 2, wherein the cancer is a solid tumor.
- 19. The method of claim 2, wherein the cancer has metastisized.
- 20. The method of claim 2, wherein the radiation is administered prior to the arsenic trioxide.
- 21. The method of claim 2, wherein the radiation is administered after the arsenic trioxide.
- 22. The method of claim 2, wherein the radiation and the arsenic trioxide are administered concurrently.
- 23. The method of claim 2, wherein said cancer is a tumor of the central nervous system selected from the group consisting of neuroblastoma, retinoblastoma, glioblastoma or oligodendroglioma.